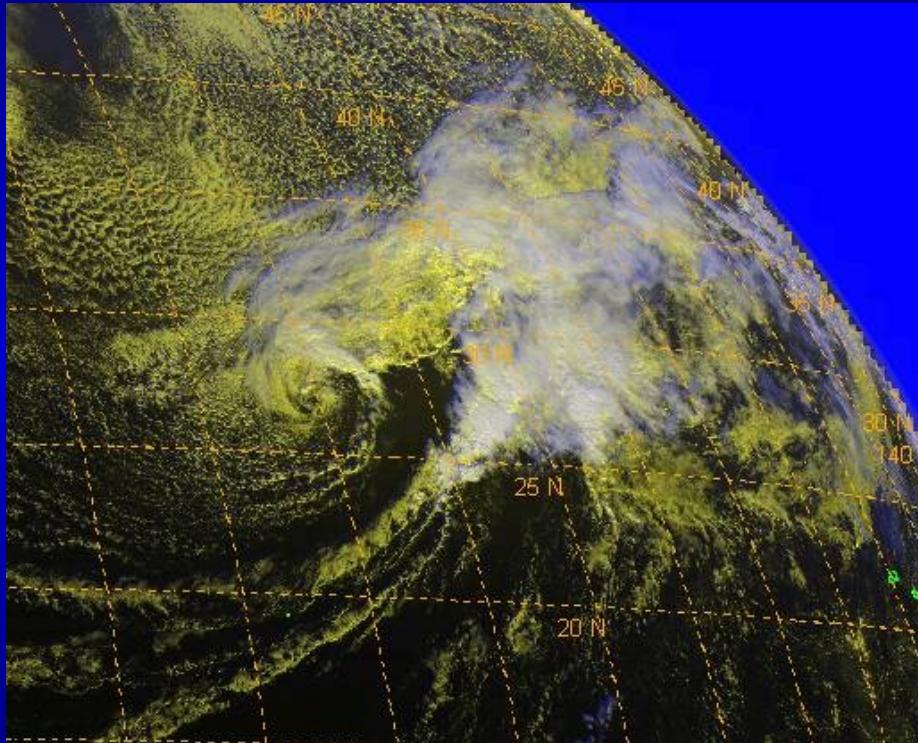




JTWC SATOPS Challenges



Capt Kathryn Payne

28 April



Overview

- JTWC as an operational center
- Dvorak Weaknesses
 - Case study 15W (Sislaku) 2008
- Intensity Estimates for Developing Storms
- Subtropical/Extratropical storms
 - Case study 27W (Haiyan) 2007



JTWC as an Operational Forecast Center



- JTWC's primary customer is DoD (also support NWS Guam)
- Supporting operations is top priority
- Operational support for Subtropical/Extratropical systems done by NMFC (with JTWC Coordination)
- 89% of TCs occur in JTWC's AOR
- Due to Southern Hemisphere/ North IO responsibility, JTWC is busy all year around (no off-season)
- Watch run by 1 TDO + 1 Satellite Analyst
- Limited resources for both operations and transition of research to operations
 - JTWC "Request for Evaluation" form



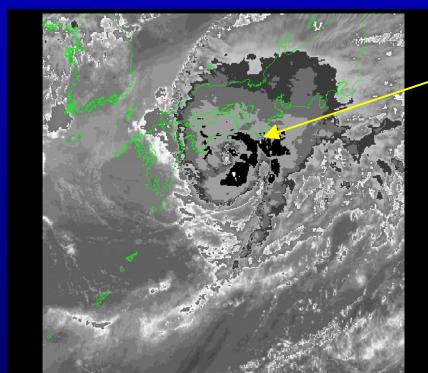
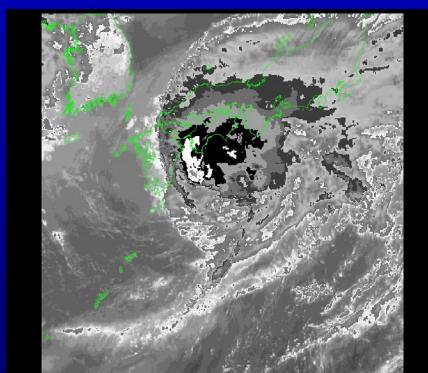
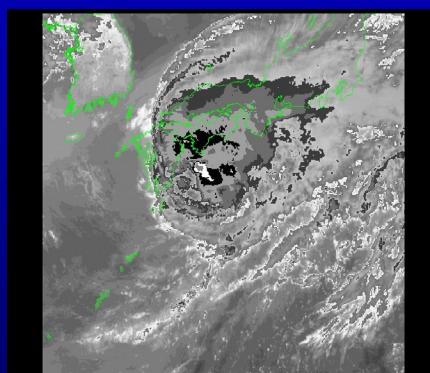
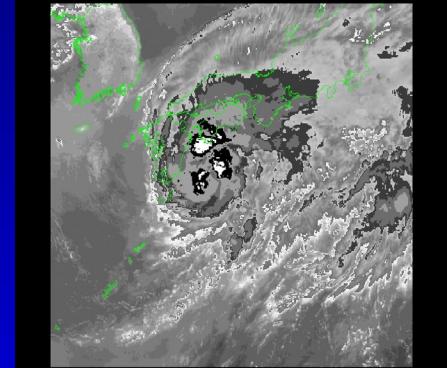
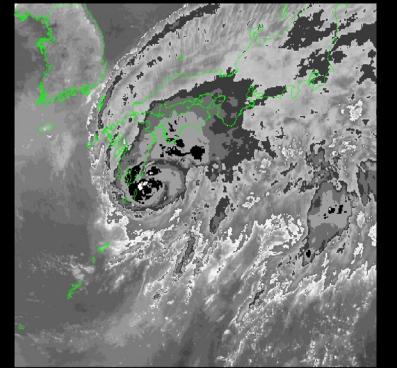
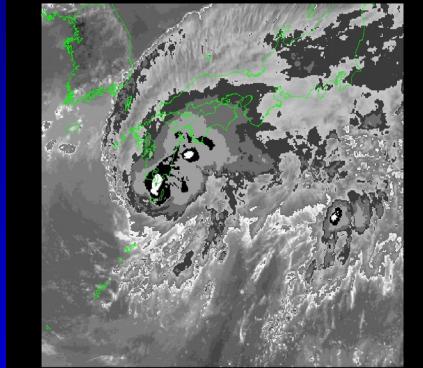
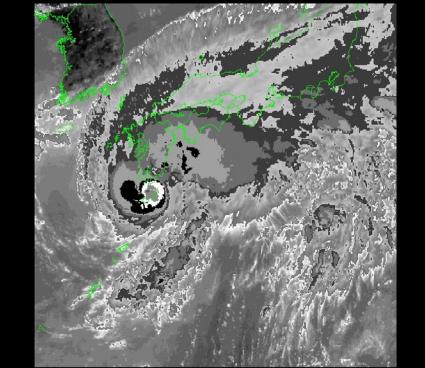
Dvorak Technique

- Due to lack of aircraft recon, Dvorak primary tool for intensity estimates
- Known weaknesses in Dvorak present problems for TDO/analyst
 - Few updates to process in 30 years
 - Subjectivity
 - Rapid intensification
 - Weakening systems
 - Weak, developing systems
 - Midgets/pinhole eye
- Dvorak advantages
 - Understandable, repeatable process
 - Can be performed “around the clock”- IR (BD) imagery
 - Worldwide standard
 - Weaknesses, though present, are known



15W- Sinlaku

Rapid Intensification south of Japan





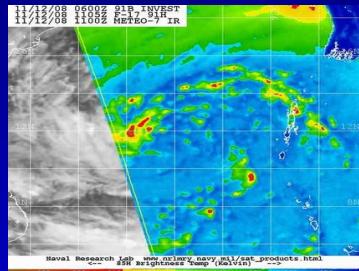
Developing Storms

- Dvorak starts at 25 kts=warning criteria for West Pac
- Wide range of Dvorak 1.0 estimates → what does a 1.0 mean for the TDO?
- Scatterometry an option, but not always available
- Ambiguities hold promise, but we need improved understanding and a repeatable process

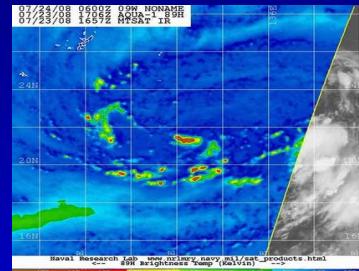


1.0 Dvorak = 25 kts

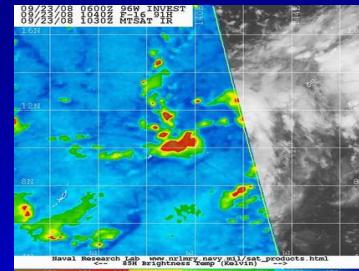
Large variance of appearance in microwave



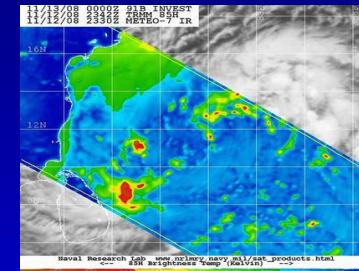
Best track: 20kts
JTWC:
1.0/1.0



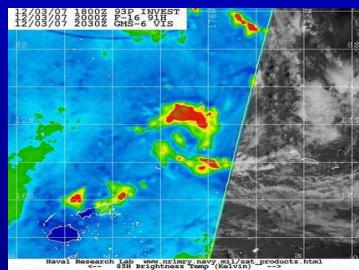
Best track: 15kts
JTWC:
1.0/1.0



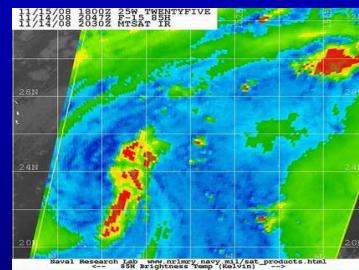
Best track: 25kts
JTWC:
1.0/1.0



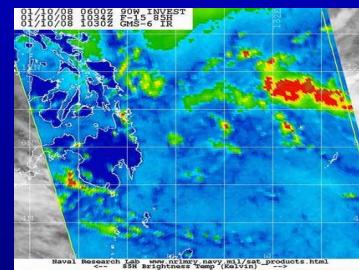
Best track: 20kts
JTWC:
1.0/1.0



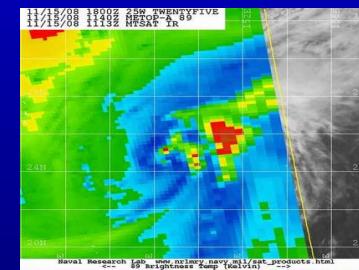
Best track: 20kts
JTWC:
1.0/1.0
KNES:
1.5/1.5



Best track: 15kts
JTWC:
1.0/1.0
KNES:
1.5/1.5



Best track: 15 kts
JTWC:
1.0/1.0



Best track: 30kts
JTWC:
1.0/1.0

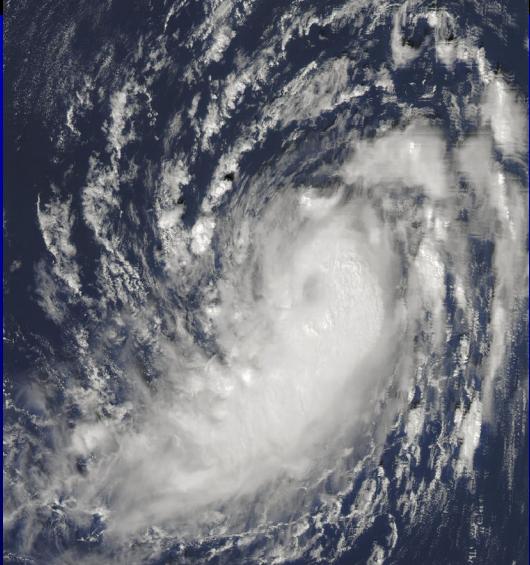
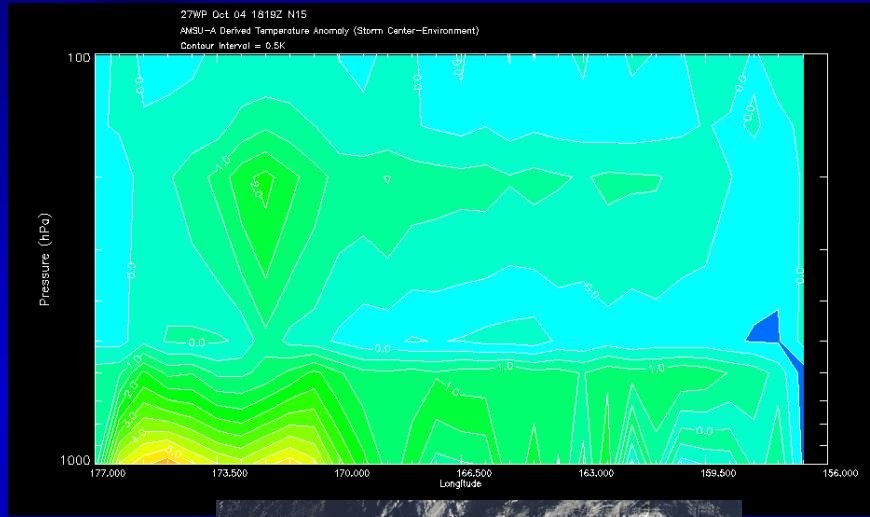


Subtropical Systems

- Less common than in Atlantic, so analysts have less experience
- Still using Hebert-Poteet method to estimate intensity (along with scat data)
- JTWC does not typically warn on ST (unlike NHC.) May choose to warn based on operational concerns
- Some ST transition to tropical
- JTWC has been working to gain better understanding of these storms



Subtropical Systems



- 27W (Haiyan) from Oct 07
- JTWC did not warn, as it was assessed to be ST
- Dvorak estimates were not representative of quikscat winds/ship obs
- Later examination of products indicated storm developed upper level warm core
- In 2007 ATCR, JTWC reclassified as a TC (27W)
- Highlighted the need for improved knowledge of subtropical systems
- Spurred increase use of AMSU-A products to assess thermal structure



Extratropical Transition

- As a TC transitions to Extratropical, warning responsibility transfers from JTWC to NMFC
- SATOPS uses Lander's XT technique to fix
 - Often use of this technique creates a “jump” in intensity when transitioning from tropical to XT
- Not always clear when a TC has transitioned to XT
 - Hard to determine warm core vs. cold core from satellite imagery
 - AMSU-A can help/cyclone phase (model data)
 - Improvements desired



Questions?



SATOPS Contacts

- OIC - Capt Kathryn Payne
Capt Stephen Chesser (Aug 09)
- NCOIC - TSgt Ken Viault
- E-Mail: ***firstname.lastname@navy.mil***
- Duty Satellite Analyst:
 - Commercial: (808) 471-3533
 - DSN: (315) 471-3533
- SATOPS Office:
 - Commercial: (808) 474-3946
 - DSN: (315) 474-3946